

## A REVIEW OF THE NORTH AMERICAN SPECIES OF COLLOPS (COL.).

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For upward of forty years the table of species of *Collops* and brief accompanying notes, published by Dr. Horn in 1870, has been the sole means by which American students and collectors have identified their material, and as such has done good service. There are however one or two positive errors in the table, and this fact together with the desirability of incorporating the considerable number of new species herein or recently described has led to the preparation of a new table. While the material upon which the present paper is based has not been sufficient for an exhaustive review, it is believed that the table together with the following descriptive and comparative notes—brief or detailed as seems necessary in each case—will enable the student to identify nearly everything now in collections with tolerable accuracy. Positive identification with females alone is often impossible, and in the material examined I have left a number of such unplaced, one or more of which may prove to be new when males are found.

Notwithstanding its instability there can be no doubt that color offers the simplest and most useful means of dividing the genus into primary groups. The tendency to variation in color appears to be very slight in some species while in others of quite similar type it is strongly in evidence; in all cases however it manifests itself in certain definite directions. In species with elytra normally maculate the spots may vary in size and often have a tendency to coalesce and form vittæ. In the normally vittate species the variation is in the reverse direction, the vittæ becoming more or less narrowed at the anterior third or even entirely divided. The thoracic spot is prone to vary much in size and may be present or entirely absent in the same species. The extreme of variation in this respect is shown in *versatilis*, in which the thorax may be entirely red, entirely black or with intermediate forms. The color of the legs is fairly constant in a few species but is subject to more or less variation in the greater number,

and in these it is the four anterior legs that are most affected. In general the variation consists in the extension of one of the colors in those having some or all of the legs bicolored, but never in my observation extends to a reversal of colors. For instance—it may be assumed with tolerable certainty that a specimen having black femora and red tibiæ is not specifically identical with one having red femora and black tibiæ, though it might not be distinct from one having the legs entirely red or entirely black. The color of the abdomen is of decided value if used with caution. The size of the lateral black spots varies considerably, but a species with abdomen normally immaculate, while it may sometimes show faint traces of lateral spots will rarely if ever have them heavily marked. In the following table care has been taken to recognize the more important color variations either in the table itself, or by tabulating the species in more than one position—or by indicating before each group those species which in certain color phases would fall in a position other than that which they occupy.

Variations in sculpture within specific limits are inconsiderable and will be referred to under those species in which it has been observed. It may be here remarked however that in most species the sides of the prothorax show a tendency to become more or less narrowly substrigose or regulose and opaque along the margin, which area may become much wider in some individuals or even in rare instances involve the whole surface. Structural characters useful in delimiting species are, aside from those offered by the male antennæ, almost wanting. The antennæ of the male, more especially the first two joints, show much diversity in form and offer specific characters of the highest importance. The very large joint with claw-like appendage, although really the third, will in the following pages be referred to as the second, which to all appearances it seems to be.

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Elytra dark blue, green or blackish, unicolorous except occasionally for a narrow pale edge at the middle of the lateral or sutural margin of the elytra.

*Group A.*

Elytra each with a broad longitudinal dark blue or greenish vitta usually more or less narrowed at basal third, the sutural, apical and lateral margins as a rule more or less completely pale. . . . . *Group B.*

Elytra rufous, each with a dark blue or green basal and subapical spot of variable size, sometimes longitudinally confluent. . . . . *Group C.*

*Group A.*

With the exception of *sublimbatus* the species tabulated below have the elytra completely unicolorous or virtually so. *Sublimbatus* is included because of its relation to *tricolor*, of which indeed it may be no more than a variety. In *tricolor* the middle of the external lateral edge of the elytra is often rufous or rufescent, and in *sublimbatus* this is more marked and affects also the sutural margin for a greater or less distance. *Necopinus* is included here to cover certain forms with nearly unicolorous elytra but with the middle of the sutural and lateral margins faintly rufous; the species however belongs more properly to the next group.

Humeri small, elytra expanded posteriorly, wings rudimentary; elytra coarsely densely punctate, shining. . . . . *cribrosus.*

Humeri larger, wings well developed, elytra much less coarsely punctate (except *punctatus* and *nigritus*).

Prothorax reddish yellow, immaculate or with at most a small central spot in some examples of *punctatus* and *parvus*.

Prothorax small, not or but little more than half as wide as the elytra, which are narrow at the humeri and strongly expanded posteriorly; femora black, tibiae and tarsi rufous. . . . . *parvus.*

Prothorax larger, distinctly more than half as wide as the elytra.

Basal joint of antennæ (♂) without dentiform prominence, though evidently angulate in *punctatus* and *nigritus*.

Legs black.

Elytra rather strongly widened posteriorly, punctuation fine, abdomen entirely or in part red.

Basal antennal joint (♂) elongate triangular,  $\frac{1}{2}$  or  $\frac{2}{3}$  longer than wide. . . . . *vicarius.*

Basal antennal joint of ♂ broadly triangular, nearly or quite as wide as long.

Elytral suture not or but feebly rufous at middle. . . . . *tricolor.*

Elytral suture and side margin in part rufous.

*sublimbatus.*

- Elytra subparallel, widest near the middle and distinctly more deeply and coarsely punctate, abdomen black.
- Second antennal joint (♂) very little if any wider than long ..... *punctatus*.
- Second antennal joint (♂) rather strongly transverse— $\frac{1}{3}$  wider than long—elytral punctuation even coarser ..... *nigritus*.
- Femora and tarsi pale rufous, tibiæ dusky or blackish.  
*marginicollis* var. *claricollis*.
- Basal antennal joint of ♂ with anterior dentiform prominence; femora red, tibiæ and tarsi blackish, size very large..... *dux*.
- Prothorax rufous with a discal black spot of variable extent, sometimes almost entirely black (spot wanting in *nigriceps* var. *floridanus*).
- Third antennal joint of ♂ similar to following joints.
- Elytra blue or green.
- Elytra densely punctate and minutely tuberculate, opaque; basal joint of antennæ (♂) triangular, appendix of second joint short.
- Antennæ of ♂ moderately serrate, front and middle legs largely rufous in typical form..... *marginicollis*.
- Antennæ of ♂ strongly serrate, legs black..... *reflexus*.
- Elytra shining, not evidently tuberculate.
- Basal joint of antennæ (♂) subquadrate when viewed from the front and above, appendage of second joint long.
- Antennæ of ♂ feebly serrate.
- Prothorax and legs black..... *hirtellus*.
- Prothorax margined with yellow, legs largely yellow ..... var. *lucens*.
- Antennæ of ♂ strongly serrate..... *discretus*.
- Basal joint of antennæ (♂) subtriangular, a little longer than wide, middle of sutural and lateral marginal beads of elytra rufescent, appendix of second joint short.  
*necopinus* var.
- Basal joint of antennæ (♂) elongate triangular, elytral margins not rufescent at middle, appendix of second joint short ..... *subtropicus*.
- Elytra black with æneous luster..... *subæneus*.
- Third antennal joint of ♂ dilated, subquadrate and much wider than the following joints when viewed from behind and above. *nigriceps*.
- Prothorax entirely rufous..... var. *floridanus*.
- Prothorax rufous with two small black discal spots; size large. *bipunctatus*.

## Group B.

Because of its close relation to *tricolor*, *sublimbatus* has been tabulated in the preceding section, but the more or less pale elytral margins would point to a position in the present group. If placed here it would fall with *confluens*, which differs by its entirely pale margins, coarser punctuation and elongate basal antennal joint of the ♂.

*Marginellus* occasionally occurs with head, under surface and legs entirely pale, in which case it may be distinguished from *georgianus* by the polished thorax and entirely pale margins of the elytra.

*Vittatus* and *marginellus* occasionally have the thorax immaculate; they are then separable from *laticollis* and *granellus* by the absence of elytral tubercles, and from *confluens* by the broadly triangular basal antennal joint in the ♂, and less coarsely punctate elytra.

*Tibialis* of the next group having the elytral spots confluent will also fall with *laticollis*, etc., but may be separated by the trilobed yellow margin of the front and nontuberculate elytra.

Both *histrion* and *versatilis* of group C occur also with the elytral spots confluent, but the sinuate basal antennal joint in the ♂ will distinguish them from any species of the present group.

Prothorax polished and strongly shining, at least medially (except in *georgianus*).

Antennæ of ♂ very strongly acutely serrate, elytral vittæ broad and scarcely narrowed at anterior third; head pale in front of a line tangent to the anterior margins of the eyes; legs, except hind femora, pale... *limbellus*.

Antennæ of ♂ moderately serrate.

Head in great part rufous, the sides only blackish, entire under surface and legs pale.....*georgianus*.

Head mostly black, under side and legs more or less black (except in some specimens of *marginellus*).

Erect hairs entirely whitish, pale margins of elytra of nearly uniform width .....*flavicinctus*.

Erect hairs of body black.

Prothorax entirely rufous.

Elytra with minute tuberculiform elevations, size moderately large.

Pale sutural and lateral margins of the elytra continuous around the apex.....*laticollis*.

Pale margins of the elytra not continuous around the apex .....*granellus*.

Elytra without trace of tuberculiform elevations.

*confluens.*

Prothorax with large discal black spot, which is sometimes divided or even entirely lacking in *vittatus* and *marginellus*.

Pale lateral and sutural margins of elytra very narrow and never entire, second joint of antennæ (♂) obviously transverse ..... *necopinus*.

Pale margins of elytra entire.

Basal joint of antennæ (♂) short, thick, broadly subovate triangular, as wide as long or virtually so when viewed from the front; second joint not or but very slightly wider than long..... *marginellus*.

Basal joint of antennæ (♂) much less stout and distinctly longer than wide, second joint usually as long as wide ..... *vittatus*.

Prothorax finely alutaceous and dull throughout, the punctures fine, sparse and evenly distributed over the entire disk; form depressed, size small (3-3½ mm.) ..... *punctulatus*.

### Group C.

Prothorax rufous with two elongate discal black spots, size large—6½-7½ mm. *validus*.

Prothorax rufous, immaculate.

Wings rudimentary or wanting, elytra narrow at base, head in great part red, basal spots of elytra elongate..... *crusoe*.

Wings developed, elytra wider at base and with the basal spots not elongate.

Basal joint of antennæ in the ♂ sinuately excavate or impressed on its posterior face.

Abdomen and legs red, the tibiæ usually dusky..... *pulchellus*.

Abdomen heavily maculate with black, rarely entirely red, legs black ..... *histrion*.

Basal joint of antennæ in the ♂ not sinuate posteriorly.

Head rufous with a small central bluish spot, legs and abdomen entirely pale ..... *scutellatus*.

Head black, frontal margin yellow as far as the eyes, its posterior border not lobed ..... *similis*.

Head black, front with a posteriorly trilobed yellow margin, the lateral lobes attaining the eyes..... *tibialis*.

Head black, front without or with very narrow yellow border, its posterior edge straight.

Basal joint of antennæ in the ♂ slender, fully twice as long as wide, elytra coarsely densely punctate..... *confluens*.

Basal joint of antennæ in the ♂ thicker and shorter, barely ½ longer than wide, elytra less coarsely punctate.

Legs bicolored, abdomen red in the ♂, maculate in the ♀, elytra more densely punctured, dull or feebly shining.

*femoratus.*

Legs black, abdomen heavily maculate with black in both sexes, elytra less densely punctured and moderately shining ..... *4-maculatus.*

Prothorax with discal black spot (lacking in *texanus*).

Elytra densely rather coarsely punctate, prothorax polished, elytral spots very large, separated by a rather narrow transverse subparallel fascia; size large ..... *balteatus.*

Elytra finely not very closely punctate, prothorax alutaceous and dull throughout, size small.

Sides of the prothorax rather broadly pale... *punctulatus* var. *insulatus.*

Prothorax entirely black..... *punctulatus* var. *utahensis.*

Prothorax entirely pale..... *punctulatus* var. *texanus.*

Prothorax black, varying to maculate or entirely rufous, elytra each with a basal and subapical spot (typical), these uniting in some specimens to form a longitudinal vitta narrowed at about the middle. Basal joint of antennæ in the ♂ sinuate posteriorly, second joint strongly transverse; elytral punctuation fine and not very close, legs black in large part, the tarsi and sometimes the front and middle tibiæ pale..... *versatilis.*

### C. *cribrosus* Lec. Proc. Acad. Nat. Sci. Phila., 1852, p. 164.

Head black, the labrum, epistoma and the anterior portion of the front pale. Antennæ pale throughout in the ♂, the outer joints more or less infusate in some ♀♀; basal joint distinctly impressed or sinuate on its posterior face, subrectangular and about one half longer than wide as viewed from the front. Prothorax black with very narrow pale lateral edge in the typical form, varying through rufous with a central black spot (rarely divided) to entirely red; surface polished and finely sparsely punctate. Elytra dark blue or green, shining, closely and coarsely punctate. Front legs pale, middle ones variable, hind ones black. Length 3-4 mm.

This is one of the most easily recognized of all our species because of the oval elytra, narrow at base and without humeri. In all the specimens that I have seen the wings appear to be completely wanting, in which respect it may be distinguished from all our other species except *crusoe*. The statement by Dr. Horn that some specimens have well developed wings and that the transition is gradual through others with imperfectly developed wings to those with none at all, I have for some time looked upon with suspicion. Horn expressly states that the better developed specimens are from the salt marshes of the Owens Valley, and to settle the question, Dr. Skinner has at my request kindly sent me for examination the greater part of

the Horn series of *cribrosus*. As I had suspected, the Owens Valley specimens prove to belong to an entirely distinct species—the *necopi-nus* n. sp. of the present paper. The true *cribrosus* appears to be strictly confined to the coast line of the Pacific, ranging from British Columbia to San Diego, Cal., and very likely into the Peninsula.

**C. parvus** Schaeff. Can. Ent., June, 1912, p. 185.

Head black, finely punctate, labrum and epistoma yellow. Prothorax small, rufous, immaculate—rarely with black spot—smooth,  $\frac{1}{4}$  or  $\frac{1}{5}$  wider than long, sides very broadly arcuate. Elytra green or blue, dilated posteriorly, punctuation dense, about as in *tricolor*. Antennæ(♂) piceous, the basal joint yellow with a black spot; (♀) basal joint pale, 2-4 bicolored, following joints piceous. Abdomen rufous with lateral black spots. Femora black, tibiae and tarsi pale. Length 3-3 $\frac{3}{4}$  mm.

Douglass, Arizona (Snow); Thornton, N. Mex. (Fenyès); S.W. Texas (Horn Coll.). Schaeffer describes simply from Arizona.

This species resembles *tricolor* in color but is smaller, and narrower anteriorly, the prothorax but little more than half as wide as the elytra. The color of the legs is quite constant in the four examples before me and quite different from *tricolor*. The basal joint of the antennæ in the ♂ is strongly angulate in front and obviously sinuate posteriorly (not so in *tricolor*), the large joint piceous on its convex face.

There are specimens of this species in the LeConte collection bearing the MS. name *femoratus*, which was evidently unpublished. Gorham uses this name for a Guatemalan species and the description fits the present insect very well, but the length, which is said to be 5 $\frac{1}{2}$ -6 mm., is so great as to make the identity of the two altogether improbable. I am much inclined to believe that the species referred to as *punctatus* on p. 316 in the supplement to Vol. III of the Biologia is the one here described and not the true *punctatus*.

**C. tricolor** Say (*Malachius*). Jour. Acad. Nat. Sci. Phila., III, 1823, p. 183.

“Head black; labrum, clypeus on its anterior margin and palpi at base rufous; antennæ pale rufous, dusky at tip; thorax transverse, nearly oval, rather short, rufous, immaculate; elytra dark bluish green or somewhat violaceous, middle of the lateral edge obsolete piceous; postpectus and feet deep black; venter testaceous.”

The above is the original description of Say, to which I may add, that in the specimens at hand the prothorax is polished and subim-



punctate except very sparsely toward the sides; the elytra feebly to moderately shining in the ♂, usually more or less dull in the ♀, rather finely punctate, the lateral edge rufous or rufescent at middle in some specimens, scarcely so in others; venter with more or less evident lateral black spots in the ♂, entirely rufous in the ♀, rarely with faint traces of spots. Basal joint of antennæ in the ♂ broadly triangular, as wide as long or very nearly so, not sinuate posteriorly.

In one of two examples collected at Plummer's Island, Md., by Dr. Blaisdell, the sutural bead is rufescent for a short distance at middle, and in the other one is entirely red, the side margin being in both narrowly red at middle as is often the case. A ♀ from Nebraska is similarly colored, but in the absence of the ♂ its identity is open to doubt. These specimens almost perfectly bridge the gap between typical *tricolor* and *sublimbatus* Schaef. and indicate strongly that the latter may be only a color phase of the former.

Say says that this species was taken on the Mississippi and that specimens also occurred near the Rocky Mts., and a slight color variety in Massachusetts. The species does not seem to be at all common in the Mississippi Valley, and a special application to Messrs. Wickham, Knaus, Wolcott and Liebeck brought me only eight specimens. Of these three are ♂'s and by antennal differences evidently include two quite distinct species, one represented by a St. Louis specimen (Liebeck), the other by examples from Indiana (Wolcott) and Indian Territory (Wickham). The two species are exceedingly similar and scarcely separable except by antennal characters. The females can only be placed when associated with males. It is obviously quite impossible to determine which of these species is the true *tricolor* of Say, and since the St. Louis specimens are apparently identical with the common form of the Atlantic coast region which has always passed as *tricolor*, Say's name may best be retained for this species.

*Tricolor* is rather common, locally at least, from Quebec to Virginia, occurring as a rule at no great distance from the coast. Its range in the Mississippi Valley can not now be determined. Females of this type have been seen from Kansas, Nebraska and Lake Superior (LeConte Coll.), but being unaccompanied by males their identity is doubtful. The Indiana and Indian Territory ♂♂ will be described below as *vicarius* n. sp.

**C. sublimbatus** Schaeff. Can. Ent., June, 1912, p. 187.

As indicated under *tricolor* the characters of this form are precisely those of that species except that the sutural and lateral marginal beads are in great part rufous. It should probably be placed as a variety of *tricolor*. It is represented before me by a ♂ cotype from Clayton, Ga., kindly submitted for examination by Mr. Schaeffer.

**C. vicarius**, new species.

Extremely like *tricolor* and separable with certainty only by the ♂ antennal characters. The basal joint of the ♂ antenna is here much less broadly triangular than in *tricolor*, being more than  $\frac{1}{2}$  longer than wide, and the 2d joint is less transverse and when viewed on the convex side the exterior apical angle is less produced and more broadly rounded than in *tricolor*.

Type from Miller, Indiana, collected by Mr. A. B. Wolcott; a second ♂ from McAlester, Indian Territory, collected by Professor Wickham.

In the type the elytra are deep blue, in the Indian Territory specimen distinctly greenish; in both they are quite shining and feebly or scarcely alutaceous and without trace of rufescent space on suture or side margin, the epipleura even being completely concolorous. The venter is more distinctly maculate at sides in the ♂ than is usually the case in *tricolor*. These characters may or may not be significant, and much more material is necessary to determine their value.

**C. punctatus** Lec. Proc. Acad. Nat. Sci. Phila., 1852, p. 164.

A rather small, narrow and convex species. Elytra blackish in the type, faintly bluish or dull green in some examples. Head black, unusually densely and coarsely punctate. Antennæ feebly serrate, black, basal joint pale with black spot, second joint pale or with the convex surface more or less blackish. Prothorax rufous, immaculate or with a discal spot of variable size. Elytral punctures very coarse, varying in density. Legs almost entirely black, ventral segments black with pale apices. The basal joint of the antennæ in the ♂ is rather strongly bent, the anterior margin distinctly angulate as viewed from above.

This species is known to me from "Kansas"; Benedict, Kansas; Malcolm, Nebraska; Colorado Springs and Fort Collins, Colorado; "New Mexico"; Pecos, New Mexico.

The type bears a green disk locality label and in the original description is said to be from "Missouri Territory" (probably Western Kansas or Nebraska); the second example is from Kansas. Two other examples from Garland, Colorado, and one from New Mexico

are wrongly placed with *eximius*, and herein, doubtless, lies the source of the erroneous recording of *eximius* from these Rocky Mt. States.

In the type the elytral punctuation is not very close, but is evidently denser in the second example, while in the New Mexico specimen it is very dense and rugose. The legs in the type are entirely black except the front and middle trochanters; in the second example the front thighs are largely pale, as are all the trochanters.

**C. nigritus** Schaeff. Can. Ent., June, 1912, p. 185.

A ♂ in my collection from the Santa Rita Mts., Arizona (Snow), agrees perfectly with Schaeffer's unique type from Arizona, which I have seen. The prothorax is more densely punctured than in any specimen of *punctatus* that I have seen and the second antennal joint is more transverse. The two species are very close but may be regarded as distinct if the antennal character holds good.

**C. dux**, new species.

*Male*.—Head, antennæ except the basal and part of the second joint, metasternum, tibiæ and tarsi, black; labrum and epistoma, base of antennæ and femora, reddish yellow; elytra blue. Head finely and quite closely punctate, minutely and less closely so anteriorly. Basal joint very thick and of irregular form, wider than long from any view point, a subdentiform prominence in front when seen from above; second joint very irregular, the convex face black except at base, and strongly emarginate and narrow in apical half when viewed from beneath, claw-like appendage long; third joint transverse, its apex squarely truncate, following joints moderately serrate, decreasing in width, the outer ones elongate. Prothorax transversely oval,  $\frac{3}{5}$  wider than long, surface polished and very finely remotely punctulate. Elytra somewhat depressed, about  $\frac{1}{2}$  longer than wide, sides straight and a little divergent posteriorly, surface very densely finely punctate and dull, vestiture of fine recurved whitish hairs and erect black hairs, the latter shorter than usual. Length  $7\frac{1}{2}$  mm. (head depressed); width 4 mm.

Del Rio, Texas. A single ♂ sent by Mr. Wickham, who retains the type.

This very large and fine species is remarkably distinct, the form of the basal two joints of the antennæ being quite unlike those in any other of our species.

**C. marginicollis** Lec. Proc. Acad. Nat. Sci. Phila., 1852, p. 164.

*Male*.—Labrum, clypeus, antennæ, venter, front and middle femora and hind femora in part, rufous; head behind the clypeus black with greenish luster. Prothorax rufous with large black spot, often leaving only a narrow pale margin; elytra blue or violaceous; meso- and metasternum black; tibiæ and tarsi black. Basal joint of antennæ triangular, about  $\frac{1}{2}$  longer than wide,

not distinctly flattened in front; second joint strongly transverse, the claw-like appendage moderate in length; following joints rather strongly serrate, all transverse except the tenth. Head minutely numerous punctulate, moderately shining. Prothorax transversely oval,  $\frac{1}{2}$  wider than long, entire surface polished and very finely remotely punctate. Elytra about  $\frac{1}{3}$  wider than the prothorax at their point of greatest width, evidently but not very strongly widened behind, surface finely densely punctate and minutely tuberculate, luster dull or but slightly shining. Vestiture as usual.

*Female*.—Second antennal joint a little longer than wide, as long as the next two, and in width equal to the fourth; color as in the ♂ except that the hind femora, and the antennæ except at base, are blackish. Length 4–5 mm. (head deflexed).

The type is from San Diego, Cal., and all the typical specimens before me are from that vicinity. Two examples from Nephi, Utah (Coll. Wickham), differ only in having all the legs black; there are also Utah specimens placed with *marginicollis* in the Horn collection. Two ♀♀ from southern Arizona submitted by Mr. Schaeffer, and one from the same region in my own collection also have entirely black legs but are otherwise scarcely separable. These agree well enough with the short description of *aulicus* Er., a Mexican species and may be that, but in the absence of ♂♂ and of authentic examples of *aulicus* nothing more definite can be said.

The following varietal form is sufficiently constant and of different appearance to merit a name.

**Var. claricollis, new var.**

Prothorax bright rufous, immaculate, femora entirely rufous and tarsi usually so, tibiæ dusky or blackish. Southern California (Pomona, Pasadena, Azusa).

**C. reflexus Lec.** Ann. Report, Chief Engineers, 1876, p. 517.

This is very similar to *marginicollis* in size, form and sculpture, and differs chiefly in the more strongly serrate male antennæ. The form of the first and second joint is virtually the same in both. The prothorax is entirely black, the margin about the basal angles being narrowly more or less brownish, and the legs are all black. The little tuberculiform elevations of the elytra are quite noticeable as they are in *marginicollis*, and by their presence these two species are readily separable from all others with unicolorous elytra except *nigriceps* and *bipunctatus*, both of which are easily recognized by other characters. The tuberculiform elevations are feebly developed in *nigriceps* and often scarcely detectable.

**C. hirtellus** Lec. Ann. Report, Chief Engineers, 1876, p. 517.

Of medium size, dull to moderately shining. Head black, shining, finely not densely punctate with widely scattered coarser setigerous punctures; labrum and epistomal margin pale. Antennæ (♂) feebly serrate, black, the lower half of the basal joint and the excavate face of the second joint, pale. Basal joint as viewed from the front triangular, excavate posteriorly, very distinctly wider at apex than long. In the ♀ the basal joint is pale with a median dusky spot, the 2d and 3d joints pale in part. Prothorax entirely black, polished and subimpunctate medially, duller and subrugose laterally. Elytra closely punctate, not tuberculate, dark blue, rarely greenish. Venter with sides more or less heavily maculate with black. Legs almost entirely black in type, the front and more rarely the middle femora becoming in part pale in some specimens.

The type series is from Taos Peak—13,000 ft.—northern New Mexico. I have also seen specimens from Elko, Nevada (Wickham); Moscow, Idaho; Pullman, Washington (Mann); and Radisson, Saskatchewan (Willing).

**Var. lucens, new var.**

A form taken at Coolidge, New Mexico, by Professor Wickham and sent out by him as *hirtellus* differs from the type series in being more shining, the prothorax with narrow pale lateral and basal margins, pale epistomal margin lobed at middle, front and middle legs pale, the hind legs largely dark in one example and with the femur and base of tibia dark in the other; basal joint of antennæ entirely pale and not wider than long. A specimen from Salt Lake, Utah (Horn Coll.), collected by Schwarz (?), has the basal antennal joint (♂) black superiorly and the thoracic pale margin present around the sides only, thus approaching *hirtellus*.

**C. discretus, new species.**

Head greenish black, labrum and anterior part of the front pale, the pale margin trilobed posteriorly, the lateral lobes reaching the eyes, the middle lobe broader and a little more produced; punctuation sparse and very fine, the setigerous punctures scarcely coarser. Antennæ (♂) strongly serrate, entirely yellow except for the apices of the outer joints; basal joint not excavate posteriorly, oblong as viewed obliquely from the front and above, broadly triangular and about as wide as long when viewed from the front and below; second joint subpentagonal, strongly transverse, appendage moderately long. Prothorax entirely black, polished throughout, punctures very fine and remote, a little closer and subsperate near the side margins. Elytra dark blue, strongly shining, rather finely and not very closely punctate. Body beneath black, the ventral sutures narrowly pale. Legs black, the front tibiae and tarsi pale. Length  $4\frac{1}{2}$  mm.

Colorado (Troublesome); a single ♂ in my own collection.

**C. subtropicus, new species.**

Head black, labrum and epistoma pale, antennæ pale at base, becoming infusate apically. Prothorax rufous with broad median black stripe; elytra deep blue; venter rufous, sides heavily maculate with black. Basal joint of antennæ (♂) subtriangular, not quite twice as long as wide, not excavate posteriorly. Second joint a little wider than long, appendix short; third joints as wide as those following. Prothorax polished, finely sparsely punctate. Elytra quite strongly shining, rather densely but not very coarsely punctate, pubescence as usual. Length  $3\frac{1}{2}$  mm.

Jacksonville and Tampa, Florida, 2 ♂'s; the former the type in my own collection, the latter in the Horn collection.

Mr. Schwarz writes me that there are similar specimens from tropical Florida in the National Museum Collection.

The specimens before me are a little smaller and even more shining, the punctuation of the elytra slightly coarser, and the basal antennal joint a little more elongate than in *vicarius*, but otherwise they are very close to the latter. The prothoracic stripe may or may not be constant in *subtropicus*; it is probably never present in *vicarius*.

**C. subæneus, new species.**

Black, elytra faintly æneous, labrum, basal joint of antennæ and the upper edge of the three following joints pale; prothorax rufous with broad black median stripe; abdomen rufous, sides heavily maculate with black; legs black. Head finely, rather sparsely punctate with a few coarser setigerous punctures; thorax finely remotely punctulate; elytra closely not coarsely punctate. Antennæ (♀) rather strongly serrate. Length 4 mm. (head deflexed).

California. Contra Costa Co. and vicinity of Sacramento. Described from three ♀'s submitted by Dr. F. E. Blaisdell.

The description of a species of *Collops* from the females only is rarely justifiable but the total dissimilarity in color of the present species makes it highly improbable that this can be a variety of any previously described form occurring in the same region; it is in any event worthy of a varietal name.

**C. nigriceps** Say. Jour. Acad. Nat. Sci. Phila., 1823, III, p. 183.

*C. eximus* Er. Entomographien, p. 57.

Var. *floridanus* Schaef. Can. Ent., 1912, p. 185.

A common species along the Atlantic Coast line from Massachusetts to Florida; it occurs also on the Gulf Coast at least as far as Mobile, Ala. The thoracic spot seems to be large and constantly present in the northern specimens but is sometimes entirely absent

in examples from Florida. These constitute the variety *floridanus* of Schaeffer; they are however connected with the type form by intermediates. It seems to have escaped notice hitherto that the form of the 3d antennal joint in the ♂ separates this species at once and decisively from all others. The female antennæ are of normal form and examples of this sex of *floridanus* may be confused with *tricolor*.

The identification by LeConte of certain specimens of *punctatus* taken in New Mexico by Snow and in Colorado by Hubbard and Schwarz, as *eximius*, was hasty and unfortunate, the error persisting in faunal lists down to the present time. My own observations lead me to the conclusion that there is no possible way of separating *eximius* Er. from *nigriceps* Say. Erichson remarks under his description of *eximius* that it is very close to *nigriceps*, differing in its shorter form, color of the abdomen and legs, and shorter hair. He describes the abdomen as rufous with the last segment fuscous, while of *nigriceps* he says: "abdomen testaceous with two series of black spots." Horn says of *eximius* in his review "abdomen and front legs rufous" and of *nigriceps* "abdomen and legs black." In this statement he is evidently influenced by Erichson; it is however quite unwarranted, for Say says in his description of *nigriceps*—"venter sanguineous, feet black, thighs sometimes rufous, particularly the anterior ones," which is almost precisely what Erichson writes of *eximius*. As a matter of fact the color of the abdomen varies from almost entirely rufous to heavily maculate with black, through all intermediate forms, while the legs may be entirely black, or with the thighs in part rufous as stated by Say. These variations are intercurrent and are not confined to any geographical region. The peculiar form of the male antennæ is the same in all.

**C. bipunctatus Say.** Jour. Acad. Nat. Sci. Phila., III, 1823, p. 185.

This is a fine large species and so well known as to need little comment. It is at once recognized by its size, combined with the entirely blue or greenish elytra, and rufous prothorax with two small rounded or oval black spots. As indicated by Horn, the color of the legs may be either entirely black or the femora may be in part red; the venter also may be nearly entirely reddish or distinctly maculate with black. The basal joint of the ♂ antenna as viewed from the front is oblong with the upper edge arcuately emarginate throughout, the upper basal angle prominent; the posterior face is excavate. The second joint, viewed from beneath, is longer than wide, the appendix long.

The species ranges from Kansas to the desert regions of southern California. The following localities are represented in the material at hand: Kansas (Wallace); Colorado (Boulder); New Mexico (Cloudcroft, Santa Fé, Highrolls); Utah (Douglass, Stockton, Eureka); Arizona (Chiricahua Mts., Bright Angel).

**C. limbellus G. & H.** Col. Heft., VI, p. 121.

*C. limbatus* Lec. Smith. Miscel. Coll., 1863-66, VI, p. 94.

Head greenish black, pale yellow in front as far as the eyes, prothorax immaculate, elytra dark blue or green with the suture and entire apical and lateral margins pale. Antennæ strongly serrate, entirely pale in the ♂, the outer joints more or less dusky in the ♀. Venter pale yellow with lateral black spots in the ♀, the latter feebler or absent in the ♂; legs varying from entirely pale except the hind femora to dark with the front and middle femora pale. The basal joint of the ♂ antenna is robust, triangular, somewhat longer than wide, not excavate posteriorly; second joint wider than long, appendage rather long.

This is a pretty species, best known by the broad parallel elytral vittæ and widely serrate ♂ antennæ. The type is from Nebraska. Other localities known to me are Wallace, Kansas (Knaus); Brownsville, Texas (Schaeffer); Pecos, Dimmitt Lake, and Roswell, New Mexico (Cockerell); Tucumcari, N. Mex. (Wickham); Clear Lake, Utah (Wickham); Independence, California (Wickham). The Brownsville and Independence specimens are not quite typical but do not appear to be specifically distinct; the latter has a small thoracic spot.

**C. georgianus Fall.** Trans. Amer. Ent. Soc., XXXVI, 1910, p. 141.

In the color of the head and the entirely pale under surface and legs, this species is almost unique. Certain specimens of *marginellus* have the head in part or entirely pale and the under body and legs also completely pale, but in these the prothorax is polished and the elytral margins entirely yellow. The antennal characters are almost precisely as in *tricolor* and *sublimbatus*.

Georgia. I have seen only the single pair from which the description was drawn.

**C. flavicinctus Fall.** Trans. Am. Ent. Soc., XXXVI, 1910, p. 140.

This species is at once distinguished from all others described by the long erect hairs being entirely pale. The head is pale yellowish testaceous in front of a line joining the middle of the eyes; prothorax black, highly polished, with very narrow pale side margins; elytra blue-black narrowly margined throughout with pale yellow, surface a little uneven and feebly shining. Antennæ pale yellow, outer angles of intermediate joints slightly infuscate. Tarsi and hind



legs blackish, front and middle femora and tibiae pale. Body beneath black, the margins of the ventral segments narrowly pale. Length  $3\frac{1}{2}$  mm.

The unique type is a ♀ taken by Snow at San Bernardino Ranch, Douglas, Arizona.

Specimens collected by Dr. Fenyes at Olancha, California, and by Professor Wickham at Clear Lake, Utah, are placed here provisionally. In elytral vestiture they agree with the type but the surface of the elytra is more shining and green instead of blue.

**C. laticollis** Horn. Trans. Am. Ent. Soc., 1870, p. 83.

The only specimens of this species known to me are in the Horn and LeConte collections, and all are from the Lower California Peninsula. The head is finely, rather closely punctate, the setigerous punctures not apparently coarser; the prothorax is immaculate, the pale lateral and sutural margins of the elytra are continuous around the apex; the venter is entirely red except the sixth segment; the elytra show the little faint tuberculiform elevations scattered over the surface. The prothorax is quite strongly transverse, but careful measurements of the two examples in the LeConte collection show it to be only  $\frac{3}{5}$  wider than long, though Horn says twice as wide as long in his description. The antennae are entirely pale in the ♂, blackish in the ♀, with joints 2-5 pale along the upper edge. Basal joint in ♂ not impressed on posterior face, subtriangular and about  $\frac{1}{3}$  longer than wide as viewed from the front, the front face somewhat concave; second joint strongly transverse. The form of the basal joint is not very unlike that in *vittatus* but the second joint of the latter species is as long as wide.

**C. granellus**, new species.

Very similar in a general way to *laticollis* and the duller western forms of *vittatus*, but differing from the latter by the very obviously tuberculate elytra, and from both by the blue elytral vitta involving almost the entire apex. The basal joint of the antenna (♂) is nearly as in *vittatus*, triangular, slightly longer than wide, the supero-anterior face flattened (but not concave), posterior face not excavate. The second joint is distinctly transverse though less strongly so than in *laticollis*, the appendage short as in the allied forms. Venter red, without or with but faint traces of lateral spots. Legs almost entirely black in the ♀, the front and sometimes the middle thighs more or less pale in the ♂. The size is rather greater than either *vittatus* or *laticollis*; length  $4\frac{1}{2}$ -5 mm.

This is apparently a rather common species in southern Arizona and is known to me from the Chiricahua Mts. (type), Santa Rita Mts. (Snow), Nogales (Schaeffer), Dragoon Mts., Pierce and Pinal Mts. (Wickham); also from St. George, Utah (Schaeffer).

I had regarded this species as a slight variety of *laticollis*, but the constant difference in the elytral vitta, and small differences in

the first and second antennal joints in the ♂, warrant its separation, at least until intermediate forms turn up.

**C. marginellus Lec.** Proc. Acad. Nat. Sci. Phila., 1852, p. 164.

This species seems to be distinctly smaller than the most nearly allied forms, the length of all specimens seen varying but little from  $3\frac{1}{2}$  mm. Its most characteristic feature is the form of the basal antennal joint in the ♂; this is very broadly ovate triangular, about as wide as long, thick, not much flattened in any aspect. The second joint is about as long as wide. In the type the pale frontal margin is wide, the prothorax is black with narrow pale margin; elytra dull, not tuberculate, pale margin continuous around the apex; venter entirely pale; legs in great part blackish. The elytral vittæ are variable in width and the head, thorax, under surface and legs vary through intermediate stages to entirely pale.

I have seen but few specimens and all from the same region—the lower Colorado River. Professor Wickham has taken the species at Needles and Yuma on the California side of the river.

**C. vittatus Say.** Jour. Acad. Nat. Sci. Phila., III, 1823, p. 184.

This species varies greatly in the minor details of form, color and sculpture and shows a marked tendency to develop races which are to a considerable extent geographical. The thoracic spot may be large or small, is often divided into two smaller ones and is not infrequently entirely wanting. The elytral vittæ are fairly constant and in my experience never completely interrupted, the lateral, apical and sutural pale margins continuous. The basal antennal joint is subtriangular, about  $\frac{1}{3}$  longer than wide, not impressed posteriorly, more or less flattened anteriorly; second joint narrower than usual, as long as wide, appendix short. In specimens from the North-eastern States the punctuation is relatively coarse, the surface shining throughout, antennæ of both sexes more or less infusate, legs almost entirely black. In specimens from the arid southwest the size is somewhat larger, the punctuation finer, surface of elytra less shining or even quite dull, antennæ of ♂ entirely pale, legs more or less pale. In Dakota, Montana, Colorado and some parts of Texas and Arizona perfectly intermediate forms prevail and I have found it practically impossible to define well-limited varieties.

Including its varietal or racial forms *vittatus* is very widely dispersed, occurring from Quebec to Saskatchewan and Arizona. It is not equally common and perhaps not continuous throughout its range.

Say described the species somewhat vaguely from the Mississippi region. It is not rare in parts of New England and Ulke records it from the District of Columbia as does Wickham from Iowa, but it is not given in the New Jersey, western Pennsylvania or Cincinnati lists, nor is it mentioned by Blatchley in his Coleoptera of Indiana. Specimens are known to me from Quebec (Rigaud), Maine, New Hampshire, Massachusetts, Michigan, Nebraska, Dakota, Montana, Saskatchewan, Colorado, Utah, Texas and Arizona.

**C. necopinus, new species.**

Head greenish black, labrum and clypeus pale; antennæ entirely pale (♂), or blackish, with the basal joint and joints 2-4 in part pale (♀). Prothorax rufous with discal black spot, sometimes involving all but a narrow margin. Elytra dark blue, the median portions of the sutural and lateral margins very narrowly rufous; prosternum rufous, meso- and metasternum black; venter rufous, sides heavily maculate with black; legs black, the front femora rufous; the front tibiæ and middle femora also frequently more or less pale. Head very finely punctate, moderately shining; prothorax polished with a few minute scattered punctures, most noticeable at sides; elytra densely, moderately strongly punctured and moderately shining.

*Male*.—Basal joint of antennæ rather robust, ovate-triangular as viewed from the front, evidently longer than wide, a little flattened on its anterior face; second joint scarcely as long as wide, appendix rather short, outer joints not very strongly serrate.

*Female*.—Second antennal joint stout, not much longer than wide, wider than those following and scarcely as long as the next two. Length  $3\frac{1}{2}$ - $4\frac{1}{2}$  mm.

Southern California—San Diego (type), Pomona, San Bernardino, Claremont, Laguna Beach.

A series from Campo, San Diego Co., on the edge of the desert differs in having the elytra green instead of blue, and in having the narrow sutural pale stripe almost obliterated; these appear to me to be only a local variety. This is perhaps the commonest species of the genus in southern California. It possesses very nearly the structural characters of *vittatus* and may be an extreme form of that variable species; the color differences are however apparently constant, the surface more shining than in the western forms of *vittatus* and the second joint of the antennæ in the ♂ is relatively wider.

**C. punctulatus Lec.** Proc. Acad. Nat. Sci. Phila., 1852, p. 165.

A small depressed species, varying in length from  $2\frac{3}{4}$  to 4 mm. and differing from all others in our fauna by the prothorax being finely evenly alutaceous and dull throughout, with fine, sparse, evenly distributed punctuation. The

head and elytra are also alutaceous, the former unusually coarsely and closely punctate, the elytra as a rule rather sparsely and finely punctate, but more coarsely so than the prothorax. The color is very variable. In the type the head and prothorax are black, the latter with side margins pale, very narrowly so at middle, more broadly so at the angles; elytra each with broad bluish black vitta, narrowed at basal third, the sutural, apical and lateral margins almost to base, pale; venter black; femora black, tibiae and tarsi pale. The prothorax varies from entirely black to entirely pale, the elytral vittae may be black, bluish or greenish and are often completely interrupted; in one example in my collection from Santa Rosa, Cal., the prothorax and elytra are entirely black; the legs vary to almost entirely black. Several names have been given to color varieties and others might be given with equal propriety—or lack of it.

**Var. *insulatus* Lec.** Smith. Miscel. Coll., 1865, p. 94.

Elytra quadrimaculate, prothorax rufous with broad median black stripe. The type is considerably above the average size (4 mm.) but I have seen very similar smaller examples.

The type is from California; a second example in the LeConte cabinet is from New Mexico; I have seen it also from the Santa Rita Mts., Arizona.

**Var. *utahensis* Schaeff.** Can. Ent., 1912, p. 187.

This is *insulatus* with the prothorax entirely black.

The type is from South Creek, Beaver Co., Utah. It is known to me also from St. George and Nephi, Utah, and from "Col." and Rifle, Col.

**Var. *texanus* Schaeff.** Can. Ent., 1912, p. 187.

This again is *insulatus* with the prothorax entirely rufous. The type is from Brownsville; it has also been taken by Professor Wickham at Tucson, Arizona.

The species is quite widely distributed in the southwest, occurring from "Missouri Territory" (type) and Brownsville, Texas, to California. The following specific localities are known to me: Texas—Brownsville, El Paso; New Mexico—Las Cruces; Arizona—Santa Rita Mts., San Bernardino Ranch, Tucson; Colorado—Rifle; Utah—Clear Lake, St. George, Nephi, South Creek; Nevada—Sutro; California—Santa Rosa, Pasadena, Pomona.

**C. *validus* Horn.** Trans. Am. Ent. Soc., 1870, p. 82.

Our largest species, and unapproached in size by any other of ours with maculate elytra except the larger specimens of *balteatus*. The size, together with the bimaaculate prothorax and entirely pale legs, are entirely characteristic. With the exception of *scutellatus* and certain specimens of *pulchellus* all other species of this group have the legs, at least in part, black.

Described from Sonora in northern Mexico. Occurs also in the peninsula of Lower California.

**C. crusoe Fall.** Trans. Am. Ent. Soc., XXXVI, 1910, p. 140.

Apterous, humeri narrow. Head rufous (♂) or with sides blackish (♀); prothorax rufotestaceous, immaculate, densely subrugosely punctate and dull; elytra yellow, each with an elongate basal, and a larger posterior spot bluish black, the entire limb and suture yellow, punctuation dense and coarse; legs bicolorous. The basal antennal joint in the ♂ is evidently longer than wide and somewhat excavate posteriorly.

San Nichols Island—coast of southern California. The narrow humeri, absence of wings, maculate elytra with basal spot unusually narrow and reaching neither suture nor margin are quite characteristic. Our only other apterous species is *cribrosus*.

**C. pulchellus Horn.** Trans. Am. Ent. Soc., 1870, p. 83.

Bright rufous, head except the labrum and epistomal margin bluish or greenish black; elytra with basal and subapical dark blue spots, which though variable in size are as a rule smaller than in the other 4-maculate species. Antennæ entirely pale in the ♂, basal joint elongate and distinctly excavate posteriorly; second joint somewhat transverse with long claw-like appendage; 3-10 feebly serrate. In the ♀ the antennæ may be entirely pale, or with joints 3-10 more or less dusky; second joint unusually elongate, twice as long as wide or very nearly so, and fully as long as the next two. Prothorax entirely rufous, usually subimpunctate and strongly shining; elytra very densely and rather coarsely punctate; venter entirely pale; legs pale throughout or with the tibiae dusky.

Arizona. The type from Ft. Grant; other examples from Phoenix and Riverside. El Paso, Texas.

**C. histrio Er.** Entom., p. 59.

*C. argutus* Fall. Occ. Pap. Cal. Acad. Sci., VIII, p. 242.

A little larger as a rule than *4-maculatus*, the elytral spots larger, usually feebly bluish or greenish, sometimes narrowly confluent, and rarely involving the entire surface except the middle of the suture and lateral edge. Prothorax immaculate, typically closely punctulate but polished except near the side margins, but varying to more coarsely and densely punctate and entirely dull. Head closely punctate, elytra very densely moderately coarsely punctate. Venter varying from almost black to entirely red; legs black. Antennæ black except at base; basal joint in the ♂ sinuate posteriorly, appendage of second joint very long; second joint of ♀ elongate, not much dilated.

The type was from Eschscholtz and was probably taken at no great distance from San Francisco. The species is known to me from

Sierra Co., Lake Co., Contra Costa Co., Los Angeles, Pasadena, San Diego and Poway, California; also from Johnson's Cañon, Prescott and the Huachuca Mts. in Arizona, and Ft. Wingate, New Mexico.

With the possible exception of *insulatus* no other species in our fauna is so generally misunderstood as the present one. As every 4-maculate species of the Pacific Coast and Southwest goes as *histrío* in one collection or another, it is of course sometimes correctly identified. Erichson's description is very brief, and Horn's remarks are still briefer and misleading, his tabular character "thorax densely finely punctured and opaque" being based on an extreme variant of the species and not warranted by Erichson's description, which states that the thorax is shining. At the time I described *argutus* my conception of *histrío* was based upon Horn's statement, and I was not then aware of the fact that the sculpture of the prothorax in *Collops* may vary greatly within specific limits. I am now convinced that *argutus* is identical with, and in thoracic punctuation not very far from the true *histrío*, the type of which probably lies between it and Horn's "*histrío* verus." In the LeConte collection, which I have recently examined, the label *histrío* is placed on a typical *argutus* ♀, and with it is the Lower California specimen alluded to by Horn, and which bears the label "*histrío* verus" in his handwriting. There is a third specimen—a ♀—mixed with *pulchellus*. *Histrío* and *pulchellus* are very closely allied and the antennal characters in both sexes are virtually identical. The latter species is rather smaller and less robust, of a bright red color, with elytral spots as a rule much smaller and never confluent—so far as I have seen; the abdomen is red and the legs are entirely or predominantly so. In *histrío* the legs are black and the abdomen is usually heavily maculate.

**C. scutellatus** Schaeff. Can. Ent., 1912, p. 186.

Pale reddish yellow, metasternum black, head with a small central bluish spot, elytra each with a basal and large oval posterior spot, blue, the spots narrowly separated; scutellum rufous. Head distinctly but finely punctate, prothorax finely rugulose at sides, polished and subimpunctate at middle; elytra feebly shining, closely rather finely punctate. Basal antennal joint (♂) fully  $\frac{1}{2}$  longer than wide, feebly dilated outwardly, subcylindrical in apical half, not impressed posteriorly; second joint subtriangular as viewed from beneath, about as long as wide, appendix long; outer joints feebly serrate. Length  $3\frac{1}{4}$  mm.

New Braunfels, Texas.

I have seen the unique ♂ type which is quite distinct in color from anything else known to me.

**C. similis** Schaeff. Can. Ent., 1912, p. 187.

Pale rufous, moderately shining, elytra 4-maculate. Head black, pale in front as far as the eyes, finely punctulate. Prothorax entirely red, polished, with a few fine punctures especially toward the sides. Elytra closely but not very coarsely punctate, the spots blue or green, the posterior one larger and oval not attaining the margins. Venter pale red without obvious lateral spots; four anterior legs red, hind legs black, the hind thighs rufescent basally. Antennæ (♂) moderately serrate, pale throughout or with outer joints slightly dusky; basal joint subtriangular, a little longer than wide, rather thick, not excavate posteriorly, not very unlike that in *vittatus*; second joint slightly wider than long, appendage short.

I have seen only two examples of this species, both ♂'s; one a cotype from Mr. Schaeffer labeled simply Utah, the other from St. George, Utah, collected by Wickham.

**C. tibialis** Schaeff. Can. Ent., 1912, p. 186.

Very similar in form, size and color to *4-maculatus*, the upper surface bright rufotestaceous, the head black, labrum, epistoma and frontal margin yellow, the latter trilobed in its posterior outline, the lateral lobes extending to the eyes, the middle one to a little beyond a line tangent to the anterior margins of the eyes. Antennæ blackish in both sexes, the basal joint alone pale in the ♂, the second and third partly so in the ♀. Prothorax immaculate and nearly smooth, elytra densely punctate and rather dull, the spots large, blue, either separated or narrowly longitudinally confluent, the posterior spots rather broadly involving the lateral margin. Abdomen bright red with large lateral black spots; legs black throughout or with tibiae and tarsi red. Length  $3\frac{1}{2}$ -4 mm.

Chiricahua Mts., Arizona, 3 ♂'s, 1 ♀. Nogales, Ariz., 1 ♀ (Wickham); Ft. Wingate, New Mexico (Liebeck).

This species is very like *4-maculatus* but differs in many details. In addition to those mentioned in the table, it may be said that the color is rather brighter, the basal antennal joint in the ♂ is not quite so thick and the dilated joint is a little different in form and with much longer appendage. In all of the males seen the elytral spots are confluent, not so in the two females. In the series from the Chiricahuas the legs are entirely black; in the Nogales ♀ the tibiae and tarsi are rufous. In a specimen from Ft. Wingate, New Mexico (Liebeck Coll.), the prothorax has two small discal black spots.

**C. confluens Lec.** Proc. Acad. Nat. Sci. Phila., 1852, p. 164.

A little smaller than *vittatus* and with the elytra rather narrower at the humeri and more oval. Head quite distinctly and rather closely punctate, with the coarser setigerous punctures strongly conspicuous. Prothorax immaculate, sides more or less broadly rugulose and dull, median parts polished and finely sparsely punctate. Elytra coarsely and very densely punctate, dull, the spots rather narrowly confluent in typical form, but often separate, the anterior ones triangular and not involving the suture at base, the posterior ones oval and not attaining either suture or side margin. Venter pale rufous with terminal segment blackish (type) or with faint lateral shades or spots. Thighs dusky, tibiae and tarsi dull rufous in the LeConte type, the front and middle thighs paler in a second example. The antennae are blackish, testaceous at base, basal joint (♂) slender, elongate, not excavate posteriorly; second joint longer than wide when viewed from beneath, the appendage long but less stout than in *histrío*. The second joint in the ♀ is narrowed and fully as long as the next two, nearly as in *pulchellus* and *histrío*.

The type was described from "Missouri Territory" (Kansas). Specimens before me are from Kansas; Wallace, Kansas (Knaus); Texas; Marfa, Texas (Wickham); Santa Fé, New Mexico (Fenyés); City Cañon, Utah (Knaus); Utah (Liebeck).

**C. femoratus Schaeff.** Can. Ent., 1912, p. 186.

Closely allied to *4-maculatus* and should intermediates occur may have to be united with it. It differs from *4-maculatus* in its somewhat larger size, denser elytral punctuations with duller surface luster, the usually entirely red abdomen in the ♂, and in having the legs bicolored instead of black. In the type the front and middle femora and the hind femora at base are red; in another example the tibiae are also in part rufescent. The ♀'s, according to Schaeffer, have the abdomen spotted with black. Length 4½ mm. (head deflexed).

Arizona—Huachuca Mts. (type); Tucson (Wickham); Nogales (Nunnenmacher).

**C. 4-maculatus Fab.** Ent. Syst. Suppl., 70.

This is a rather large species, of about the same size as *bipunctatus*. I have seen but few specimens, and these exhibit almost no variation. The elytral spots are so large that it may best be described as having the elytra blue with a narrow border and a transverse fascia at anterior third, yellow or rufous. The basal antennal joint in the ♂ is thick, subtriangular, scarcely longer than wide, and sinuate on its posterior face; the second joint is more narrowed apically than in any other species known to me, and is very plainly longer than wide. The legs are almost entirely black, the venter heavily maculate.



**C. balteatus Lec.** Proc. Acad. Nat. Sci. Phila., 1852, p. 230.

This is a rather large species, of about the same size as *bipunctatus*. I have seen but few specimens, and these exhibit almost no variation. The elytral spots are so large that it may best be described as having the elytra blue with a narrow border and a transverse fascia at anterior third, yellow or rufous. The basal antennal joint in the ♂ is thick, subtriangular, scarcely longer than wide, and sinuate on its posterior face; the second joint is more narrowed apically than in any other species known to me, and is very plainly longer than wide. The legs are almost entirely black, the venter heavily maculate.

It is known to me only from Texas.

**C. versatilis, new species.**

*Male*.—Head and thorax black, labrum and antennæ pale; elytra reddish yellow each with a small basal and a larger subapical spot dark blue; body beneath black, the margins of the ventral segments narrowly rufous; legs black, all the tarsi and the front tibiæ pale, middle tibiæ dusky. Basal joint of antennæ sinuate posteriorly, second joint fully  $\frac{1}{2}$  wider than long, outer joints feebly serrate. Head shining, sparsely very finely punctate posteriorly, the punctures a little larger and closer anteriorly. Prothorax  $\frac{1}{2}$  wider than long, sides feebly arcuate and subparallel in middle two-thirds, disk polished and very minutely and remotely punctulate medially, becoming somewhat abruptly dull and a little uneven in about the lateral fourth. Elytra finely punctate, not distinctly scabrous, the punctures separated by from one to two times their diameters. The basal spots are strictly basal, rounded behind and attain both the side margin and the scutellum.

*Female*.—Similar to the male, the antennæ of the usual type in this sex, the clypeus and the middle tibiæ pale. Length 4-5 mm.

The male and female types described above were taken at Cole in northern California by Dr. Fenyès. With them I place specimens from Lake Co., Contra Costa Co., Sonoma Co., Santa Rosa (Rick-secker), Mokelumne Hill, Alameda Co., Pomona and Pasadena in California; Oregon; City Cañon, Utah; and Arizona.

If the specimens united under this name are conspecific, and I have no doubt of this, the species is an exceedingly variable one in coloration. In two of the three Lake Co. ones the prothorax is entirely pale, in the third pale with a discal black spot, and in these the legs vary from entirely pale except the hind femora to entirely black except the tarsi. In the Utah specimens the prothorax is black with a narrow pale margin; in one from Contra Costa Co., Cal., there

are two small widely separated spots; in all those from southern California it is immaculate. The elytral spots vary much in size and in the Oregon examples coalesce into a broad vitta narrowed a little before the middle; the spots are sometimes dark green instead of blue.

Some specimens are colored nearly as in *insulatus* and were once somewhat generally distributed as such by Ricksecker.

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## GALL-FLY PARASITES FROM CALIFORNIA.

BY DAVID T. FULLAWAY,

HONOLULU, HAWAIIAN ISLANDS.

While at Stanford University, in 1910, I had an opportunity to study a fine collection of cynipid gall-flies collected by Mrs. Rose Patterson Blakeman. This collection was made by Mrs. Blakeman when a student in the University in 1905-6-7, and contains most of the described species from California. The collection also includes the parasitic species bred from the galls, but this material I was not able to examine carefully until recently. Although there is nearly as much parasitic as host material in the collection, I can distinguish only a few species, which are described herewith.

### CHALCIDOIDEA.

#### TORYMIDÆ.

##### TORYMINÆ.

#### SYNTOMASPIS Förster.

##### *S. californica* Ashm.?

*Female*.—Length 4.5 mm., ovipositor 7.5 mm., expanse of wings 9 mm., greatest width of fore-wing 2 mm. Head and thorax (except mesopleura posteriorly and metathorax, which are smooth and shining) rather coarsely transversely rugose, the mesonotum, axillæ and scutellum in front of the transverse line which divides it beyond the middle, with very coarse umbilicate punctures; these much finer and largely effaced on head and pronotum; scutellum beyond the transverse line shagreened; all covered with a whitish pubescence which is especially marked on face and metathorax laterally; abdomen and legs smooth and shining, but microscopically reticulate, coxæ rather coarsely so, with a few sparse hairs.